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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,978	03/11/2004	Setsuya Iwashita	9319G-000731	5337
27572	7590	06/08/2005	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			SUMMONS, BARBARA	
			ART UNIT	PAPER NUMBER
			2817	

DATE MAILED: 06/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/798,978

Applicant(s)

IWASHITA ET AL.

Examiner

Barbara Summons

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-16 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/11/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-10 and 12 are rejected under 35 U.S.C. § 102(b) as being anticipated by Yano et al. U.S. 6,045,626.

Fig. 1A of Yano et al. discloses a surface acoustic wave (SAW) element (see e.g. col. 1, lines 4-9) comprising: a single crystal substrate 2 of silicon that has a face orientation of (111) [see col. 8, lines 51-55]; a buffer layer 21 formed by a crystal film that is an epitaxial film of a rare earth oxide (see col. 10, lines 35-36 and 52-59), is formed on the single crystal substrate 2; and surface layer 22 is a piezoelectric thin film that is an epitaxial film (see e.g. col. 4, lines 18-31 and col. 12, lines 56-58) having a hexagonal system crystal structure (see col. 11, line 41), and is formed on the buffer layer 21.

Regarding claim 6, the substrate 2 has a natural oxide film on its surface formed from SiO<sub>2</sub> (see col. 16, lines 53-62). Regarding claim 8, the surface layer/piezoelectric thin film is disclosed as ZnO or AlN (see e.g. col. 13, lines 58-60 and col. 14, lines 19-20). Regarding claims 9, 10 and 12, Fig. 1D shows an electroconductive metal film 23 between the buffer layer 21 and the surface piezoelectric layer 22, wherein the metal film is an epitaxial film (see col. 14, lines 45-46).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. §103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 13-16 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Yano et al. U.S. 6,045,626 in view of JP 2003-17981 (cited by Applicants).

Yano et al. discloses the invention as discussed above, except for disclosing the specific structure of the SAW device. Yano et al. does disclose that its substrate is for use with SAW devices and includes filters (see col. 1, lines 4-9; col. 4, lines 28-33; and col. 5, lines 2-4) and Yano et al. also discloses that a metal thin film, such as the top layer in Fig. 1B, can be a functional layer (such as the electrodes) of the device (see e.g. col. 14, lines 16-19 and 59-64).

JP 2003-17981 discloses the exact same structures of a filter and an oscillator (see Figs. 3-6) as the instant application.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW element of Yano et al. (Fig. 1A) such that it would have been a SAW filter or oscillator having each of the recited features, because Yano et al. explicitly suggested its substrate for use with SAW devices (see paragraph above) which one of ordinary skill would have known included filters and oscillators, as these would have been merely obvious intended uses, and further because of the exemplary suggestion of the structure of such devices by JP 2003-17981 (Figs. 3-6) which structures would have been known by one of ordinary skill in the art.

#### ***Allowable Subject Matter***

5. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

#### ***Conclusion***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nakahata et al. U.S. 22003/0011280 discloses that it is known to provide a protective film on SAW devices (see section [0011]) that also stabilizes the temperature characteristics of the device, and Fig. 7 shows a SAW filter.

Noguchi et al. U.S. 6,855,996 discloses a SAW device substrate with a wurtzite hexagonal thin film and a buffer layer.

Finder et al. U.S. 6,555,946 discloses a SAW device (see Figs. 7 and 8) integrated with a semiconductor device formed on a silicon substrate and having a buffer layer to provide an epitaxial piezoelectric layer (see e.g. the abstract).

Lee et al. U.S. 6,583,690 discloses a SAW filter formed on a substrate having a GaN buffer layer.

Noguchi et al. U.S. 6,258,459 discloses a SAW device that explicitly includes filters and VCO's (see col. 1, lines 24-26), and the substrate including a rare earth oxide buffer layer (see col. 3, lines 38-39).

Yano et al. U.S. 6,198,208 is similar to the above cited art and shows by its Title that it is for piezoelectric devices.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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June 2, 2005



**BARBARA SUMMONS  
PRIMARY EXAMINER**